

Substitute Specification

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Amendments to the Specification:

Provisional Application of

Christopher E. Smith and Samuel K. Giles

For

Vehicle Security System

Related Application

Priority as claimed under 35 USC 119/e for

Provisional Patent Application 60/470566, filed May 14, 2003

Summary of Invention

The present invention relates to interacting with a security system through a watch interface. The watch will be comprised of a display screen(s) that will show digital read-outs of the security system's status. The invention comprises relaying regular watch functions (time, date, etc.) also on a display screen(s).

Substitute Specification**- 2 -****Background – Field of Invention**

This invention relates to security systems for vehicles and will later expand to homes. A user of the remote watch will not only be able to keep track of the time but also will be able to arm/lock, disarm/unlock and remotely start their vehicle by pushing specific buttons on the watch. It is common for people to lose or misplace their keys along with the keyless remote that is attached to the keys. Since the watch is placed on the users wrist, the user never has to worry about damage due to dropping it on a hard surface, in liquids (ex. water), or even losing their keyless remote as you would by having a keyless remote attached to keys or a key chain.

Background – Prior art (Discussion and Criticism of the relevant prior art)

Some of the latest inventions in the field of car security have been the 2-way transceivers.

They comprise of:

- i. A display screen
- ii. 4 buttons
- iii. A small antennae

The 2-way transceiver remote confirms that your vehicle has received signals and alerts the user to system triggers and theft attempts. This remote can display 20 different icons including transmit, receive, remote start, arm/disarm, hood, trunk, door ajar, and extra sensors. The Auto Security Compustar is a semi-small remote start keyless entry that displays a car on the screen and shows the part of the car that is being tampered with.

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These particular devices look like toys. They both still hold true to the traditional keyless entry remotes that can be attached to a key chain and possibly damaged by those people who toss their keys around and lost by those who are careless. It is also not waterproof as our invention can be and will not have the style along with convenience, as our invention will.

Objectives and Advantages (positive aspects of invention)

- The advantages of this invention are:
 - i. Digital or analog or a combination of digital/analog
 - ii. Linking the individual to his/her vehicle at all times
 - iii. Vibrates/beeping sound to alarm an individual whenever the vehicle is being tampered with and when the alarm is triggered.
 - iv. The watch gives you feedback by transmitting the condition of the vehicle.
 - v. This invention is located in the most convenient and easy to access area, the user's wrist. Having the device on the wrist will allow hassle-free convenient usage. Other car security devices have to be pulled out of a pocket, bag, or another area.
 - vi. The watch displays the time.
 - vii. Keeps track of time and a vehicle at all times.
 - viii. If you loose your keys you will also loose your keyless entry alarm remote. Since the security system is located on the watch, a person does not have to worry about losing the keyless remote.

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- ix. If you loose your keys then a person can feel safe about leaving a spare key in the car because they will still be able to unlock and disarm the security system from the remote watch which is worn on your wrist and not attached to the keys which can be lost.

Drawings & Figures

- Figure 1 Block Diagram of Digital Watch Remote Security System
- Figure 2 Block Diagram of the Digital Watch Remote
- Figure 3 Basic Outline of Switching Device
- Figure 4 EnMOSFET Switch (EACS) Diagram
- Figure 5 Small AC Equivalent Output Circuit
- Figure 6 Block Diagram of EACS Controlled Switch System
- Figure 7 Side view of the watch, which is a basic means for controlling the security system.
- Figure 8 Frontal/top view of the means for controlling the security system.
- Figure 9 Frontal and side view of a prototype means for controlling the security system.
- Figure 10 Frontal view of the means for controlling the security system.

Reference Numerals**Figure 1: Block Diagram of Digital Watch Remote Security System**

100-Controller Processing Unit	115-Valet Switch
102-Remote Watch	116-Window Control
101-Antenna	117-Panic Output
104-Memory Unit	118-Starter Kill
105-Timer	119-Disarm Output
106-Trigger and Sensor Circuitry	120-Armed Output
107-Proximity Detector	121-Automatic Starter
108-Transceiver	122-Character Display
109-Input Interface	123-Dome Light
110-Output Interface	124-Valet/Dashboard LED
111-Ignition Switch	125-Park Lights
112-Trunk Switch	126-Siren
113-Hood Switch	103-Operational Signal
114-Door Switch	

Reference Numerals**Figure 2: Block Diagram of the Digital Watch Remote**

200-Watch Remote Console	207-Control Section
201-Keypad	208-Timer
202-Liquid Crystal Display	209-Mode Controller
203-Memory	210-Code Generator
204-Date(Month/Day)	211-Transmission Section
205-Time(Hour/Minute)	212-Code Data
206- Buzzer	

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Reference Numerals**Figure 3: Basic Outline of Switching Device**

300- Watch & Remote Control Transmitter	302- Switch select lines
301- Switching Circuitry	304- Select Switching Lines

Reference Numerals**Figure 4: EnMOSFET Switch**

400-Switched Circuit	403b-Gate of enhancement MOSFET switch
401-Low voltage terminal of the switch	403c-Drain of enhancement MOSFET switch
402-High voltage terminal of the switch	404-2k Ω Resister
403-n-channel enhancement MOSFET	405-Power Source
403a-Source of enhancement MOSFET switch	

Reference Numerals**Figure 5: Small AC Equivalent Output Circuit**

500a-What the AC output circuit is connected to	504a-2k Ω Resister
500b- What the AC output circuit is connected to	504b-2k Ω Resister
501a-High voltage terminal of switch (on)	505a- Drain of enhancement MOSFET switch (on)
501b- High voltage terminal of switch (off)	505b- Drain of enhancement MOSFET switch (off)
502a-Low voltage terminal of switch (on)	506a-Source of enhancement MOSFET switch (on)
502b- Low voltage terminal of switch (off)	506b- Source of enhancement MOSFET switch (off)
503a-RDS on – On position resister	503b-RDS off – Off position resister

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Reference Numerals

Figure 6: EACS Controlled Switch System

600-3V Battery voltage	605a-Voltage for Low Line 8 to 1 Multiplexer
601-Remote transmitter circuit	606- Low voltage terminal of the switch
602-Watch Circuit	607- High voltage terminal of the switch
603a-High voltage lines for the watch circuit	608-Voltage for EACS Switch
603b-Low voltage lines for the watch circuit	609-EACS Switch
604a-High voltage lines for the Remoter	610- Gate of EACS switch
Transmitter circuit	
604b-Low voltage line for the Remote Transmitter	611- High Line 8 to 1 Multiplexer
circuit	
605-Voltage for High Line 8 to 1 Multiplexer	612- Low Line 8 to 1 Multiplexer

Reference Numerals

Figure 7: Flip-up Watch Remote Drawing

701- Exterior Digital Clock	705- Entire Flip-up component Hinged Body
702- Interior Display Screen	706-Base
703- Interior Display Screen	707-Mode Button
704- Keypad	708-Select Button
<u>727 - Hinge</u>	

Reference Numerals

Figure 8: Flip-up Watch Remote Drawing

801- Exterior Digital Clock	806-Base
802- Interior Display Screen	807-Mode Button
803- Interior Display Screen	808-Select Button
804- Keypad	809- Light
805- Entire Flip-up component Hinged Body	810- Select <u>Hinged Body Open Button</u>

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Reference Numerals**Figure 9: Basic Watch Remote Drawing**

900-display screen	904- remote start
901-light	905- arm/lock
902- disarm/unlock	906-base
903- panic	907- mode

Reference Numerals**Figure 10: ~~Button~~ Keypad Description of Watch Remote**

1001-outside digital clock	1015-numeric 7/letters Q,R
1002-display screen	1016-numeric 8/letters S,T
1003-display screen	1017- numeric 9/letters U,V,W
1004-keypad (touch buttons)	1018- numeric 0/letters X,Y,Z
1005-entire flip up component	1019- numeric 4/letters I,J
1006-base (where battery and other internal components are stored)	1020- numeric 5/letters K,L
1007-side button (mode)	1021- numeric 6/letters M,N
1008-side button (open	1022- up scroll/letters O,P
1009-side button (light)	1023- numeric 1/letters A,B
1010-side button (select)	1024- numeric 2/letters C,D
1011-remote start	1025- numeric 3/letters E,F
1012-arm/lock doors	1026- down scroll/letters G,H
1013-disarm/unlock doors	1027-hinge
1014-panic	

Description –Main Embodiment (narrative of the structure)

Figure 7 shows the side view of the remote watch. The digital clock **701** located on the outside surface of the ~~flip-up-component~~ hinged body **705** will display watch information such as the time and date. The interior display screen **702** located on the base **706** of the watch remote will display the time and alternative watch functions (calendar, schedule, etc.). The interior display screen **702** is displayed when the ~~flip-up-component~~ hinged body **705** is opened. The display screen **703** located on the inside of the ~~flip-up-component~~ hinged body **705** will display feedback of various car functions. For example, if the armed button is pressed, the display screen **703** will display feedback information for the car alarm functions related to arming the vehicle.

Figure 8 shows the same version of the watch from a frontal/top view displaying the entire ~~flip-up-component~~ hinged body **805**, the hinge **827** whereby the said ~~flip-up-component~~ hinged body **805** will be able to be attached to the base **806** and flip upward showing the interior components. The entire ~~flip-up-component~~ hinged body **805** that contains an outside digital clock display **801**, an interior display screen **803**, and base **806**. The said ~~flip-up-component~~ hinged body **805** is preferably made of stainless steel and has a thickness less than that of the base **806**. The outside display clock **801** will preferably be a liquid crystal display screen, where the width of the screen will be the same as the interior display screen **802**. The length of the said outside display clock will be less than half of the interior display screen or at least 1.0 cm long. The interior display screen **802**, a display screen **803**, and a keypad **804** are visible when the said ~~flip-up-component~~ hinged body **805** is opened by pressing the hinged body open button **810**. Both the interior display screen **802** and the other display screen **803** will also be liquid crystal display screens. Display screen **803** 802 will show the functions of the car alarm (ex. If the alarm is armed or disarmed, remote started, sunroof open/closed, etc.). A Said display screen **802** **803** is shown directly below the said display screen **803** 802 as seen in figures 7 and 8. Display screen

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802 803 will display the time, date, and calendar that are accessed through the use of the mode button

807. The light button 809 will be used to activate the background light for all display screens. With the select button 808, the user will have the ability to activate the menu options.

Operation –Main Embodiment (How it works)**Explanation of Circuits**

Figures 3, 4, 5, & 6

This design assumes the main source of power is a 3 V DC supply for a watch circuit and for a remote control transmitter circuit. It is assumed that eight single-post-single-single-throw switches are available, each connected to some switched circuit and each with a low voltage terminal and a high voltage terminal. The circuit works for a low voltage terminal post that is approximately at ground potential and for small AC signals at open-circuited switch terminals. The L^{th} pair of switch lines are connected to an impedance (Z_{SDL}) that models the L^{th} switched circuit, $L \in \{1, 2, \dots, 8\}$.

Figure 3

By assumption, eight switches are available from two systems: the watch and the remote control transmitter 300. The switching circuitry 301 enables the controlling and operating means of the watch and security system functions by the selection of any one of the eight pairs of lines 304 across which a switch can be placed. This selection occurs by placing a three-bit binary address on the switch select lines 304. In addition, the switching circuitry 301 develops an electronic switch that opens and closes, placing it across the selected pair of lines (the L^{th} lines).

Figure 4

Normally a mechanical SPST switch with two terminals is connected to a “switched circuit 400.” This switch is removed, replaced by an electronic switch 403. The electronic switch 403 consists primarily of an enhanced metal oxide semiconductor field effect transistor (EnMOSFET). The EnMOSFET switch consists of a source 403a, gate 403b, and drain 403c. The EnMOSFET AC Switch (EACS) circuit indirectly connects the high 402 and low 401 terminals of the switch for small AC signals. The $2\text{k}\Omega$ resistor 404 on the drain provides on-state protection, and determines a DC quiescent point.

Figure 5**A & B**

Figure 5a shows the EnMOSFET switch connected to the AC output **500a**. When the gate voltage of the EnMOSFET switch is high **501a** (~3 V), turning the transistor on, an AC ground exists on the drain **505a** terminal of the FET placing the drain **505a** and source **506a** at approximately the same potential. Figure 5b is the closed circuit condition of the electron switch. When the gate voltage is low **502b**, AC current flow discontinues resulting in an open circuit or the open electron switch **503b** condition. The 2k Ω resistor **504b** on the drain provides on-state protection, and determines a DC quiescent point.

Figure 6

This design assumes the main source of power is a 3 V DC **600** supply for a watch circuit **602** and for a remote control transmitter **601** circuit. It is assumed that eight single-post-single-throw switches are available, each connected to some switched circuit and each with a low voltage terminal (**603b** & **604b**) and a high voltage terminal (**603a** & **604a**). The switching circuitry primarily consists of the EACS **609** and two multiplexers. Two 8-to-1 multiplexers operate in parallel sharing the same address lines (switch select lines). One multiplexer **611** selects the high potential terminal of the Lth switch and the other **612** selects the low potential terminal. The EACS **609** produces the opening and closing actions of the switch.

Operation**Figure 2****Watch Transmitter**

The remote watch car alarm system includes the watch (see Fig.2) and an onboard control module (see Fig 1). The watch that is worn by the vehicle owner/operator consists of an LCD screen **202**, operational keypad **201**, code generator **210**, mode controller **209**, memory **203**, timer **208**, transceiver **211**, and buzzer **206**. The onboard module (see fig 1) will consist of a controller processing unit **100** or a microprocessor program controller, timer **105**, memory unit **104**, transceiver **108**, proximity detector **107**, sensor zone circuitry **106**, input interface **109**, and an output interface **110**.

Referring to the schematic block diagram of FIG. 2, the remote watch includes a liquid crystal display **202** for displaying such information as the time, date, Mode State of the watch, and preset alarm times. The said watch will also include an operational keypad **201** for entering a variety of functions including, information for the date and time or car security functions such as arm/disarm, remote start and etc.

The control section **207** of the watch has a mode controller **209**, code generator **210**, and an alarm timer **208**. The mode controller **209** sets the mode in which the watch will operate. The code generator **210** inputs code data **212** to the circuitry of the transceiver **211**. The timer **208** will cause the mode controller **209** to switch back to the watch setting (mode) after a car security button is pressed on the keypad **201**. The timer **208** will then alert the user when an alarm time is activated via the buzzer **206**. As would be readily understood by those skilled in the art.

The digital remote watch further includes memory (**203**) and a buzzer (**206**). The memory **203** will be used for storage of data such as the set alarm generating time (wake-up alarm), the mode being currently affected, the month, day, year data, and the time (hour/minute). The buzzer **206** will chirp with the corresponding car security functions (ex. arm/disarm) as well as with (wake-up) alarm settings.

Operation

Figure 1

Onboard Control Module

Referring to Fig. 1, the operational signal **103** from the digital watch remote **102** is received by the external antenna **101** then the transceiver **108** receives the amplified signal from the transmitting/receiving antenna **101** and feeds the received operational signal to the proximity detector **107**. The proximity detector **107** verifies the interrogating signal, detects the level of received operation

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signal, generates a proximity signal when the signal is above a predetermined level, the detector then feeds the proximity signal to the controller processing unit **100**.

The controller-processing unit **100** generates a series of control signals or pulses as its outputs. These include activities such as locking the doors and arming the system. For example, arming the system causes a flash of the automobile parking lights **125**, a single chirp from the siren **126**, and causing the flashing the interior LED **124** status indicator to activate. Additionally, arming the system causes the starter **118** to be cut and if the interior dome light **123** is on, to turn it off, as would be readily understood by those skilled in the art.

The timer component **105** measures a preset time and is set and/or reset under the control of the controller-processing unit **100**. The memory **104** functions as an internal memory for the controller-processing unit **100** or as an auxiliary memory for other components or devices incorporated in the system. Data writing to or reading from the memory is performed under the control of the controller-processing unit **100**. This is readily understood by those skilled in the art.

As illustrated, the input interface **109** is connected to various vehicle inputs including an ignition switch **111**, trunk switch **112**, hood switch **113**, door switches **114**, key in ignition switch, pre-warn sensor, valet switch **115** and zone sensors **106**. The sensor zone circuitry **106** performs the security function of the automobile. When the sensor zone circuitry **106** detects ~~touching~~ tampering, it generates a signal and feeds it directly to the controller-processing unit **100**. As would be readily understood by those skilled in the art, other inputs are also contemplated by the present invention and are described by the term sensor.

The output interface **110** of the controller-processing unit **100** can be connected to a variety of output devices. The outputs may include and not limited to auxiliary relays such as window control **116** or remote start **121**, as would be readily understood by those skilled in the art. Other outputs include a

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panic output 117, starter kill 118, disarm/arm outputs 119/120, dome light 123, parking lamps 125, siren 126, alphanumeric character display 122, and valet/dashboard red or green emitting LED's 124.

Operation**Figure 9****Basic Design**

Figure 9 shows a prototype of the watch from a top view and a side view showcasing buttons for the security system and display screen. The manner of using the watch remote security system is simple, the security system can be armed by pushing the arm button 905 and disarmed by pushing the disarm button 902. The panic button 903 will cause the alarm to sound when pushed. The mode button 907 will enable a person to change the time/date. The light button 901 will illuminate the display screen(s).

Operation**Figure 10****3-Display Screens Design**

~~Figure 10 shows a version of the watch from a frontal and top view showcasing the entire flip-up component 1005, interior display screen 1003, interior display screen 1002, buttons 1007, 1008, 1009, 1010 and keypad 1004 in detail. The manner of using the digital car alarm watch remote begins while the watch is closed. The flip-up component 1005 will lie on top of the base 1006. The base 1006 encompasses the battery, circuit board, wiring, mounting for a keypad 1004, and docking area for a display screen 1002. The outside of the digital clock (not shown here but on Figure 7 Reference~~

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~~Numeral 1) will be on the outside of the said flip-up component 1005. Flip-up component 1005 will be attached by a hinge 1027 to base 1006. When the open button 1008 is pressed, the hinge 1027 will allow the flip-up component 1005 to open and showcase a display screen 1003. Display screen 1003 will show the functions of the car alarm (ex. If the alarm is armed or disarmed, remote started, sunroof open/closed, etc.). The said display screen is where the regular watch functions such as the time, scheduling, a calendar and memos, can be changed/updated through a menu selection screen. For example, if a user wants to change the time on display screens 1002 and 1001 (see figure 7 & 8), they would do so through the menu selection screen on said display screen 1003. The user will use the mode button 1007. The user can switch the function of the watch using the directional buttons 1022 & 1026 to navigate through the menu options, and the select button 1010 or the tri-functional button 1018 will be used to select a particular menu option. A display screen 1002 is shown directly below the said display screen 1003 as seen in figures 7 and 8. Display screen 1002 will display the time, date, and calendar that are accessed through the use of the mode button 1007.~~

~~Below said display screen 1002 is a keypad 1004 that will allow the user to control the functions of the car security system. Through the use of keypad 1004 the functions of the car security system can be activated. The following will describe buttons dedicated to functions relating to the car security system. The remote start button 1011 will start the user's vehicle; arm/lock button 1012 will arm the security system and lock the user's vehicle. The disarm/unlock button 1013 will disarm the car security system and unlock the vehicle; the panic button 1014 will cause the car security alarm to activate when depressed. Reference numerals 1015-1021 are alpha/numeric buttons which are used for inputting numbers/letters for the setting of time, date, names, changing the date, telephone numbers, etc.~~

Reference numerals 1022 & 1026 are the alpha/directional buttons, which navigate the user through the digital security watch's menu functions. Button 1018 is a tri-functional button that allows the user to select a menu option, input the number 0, or the letters XYZ.

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~~The buttons located on the side of the base 1006 are other functional buttons for the general operation of the watch. The light button 1009, when depressed will provide backlight for all display screens (Reference numerals 701, 702, and 703 Figure 7). The mode button 1007 will allow the user to switch from the security functions to the watch functions (time, date, telephone etc.) or vice versa, and the select button 1010 will activate one of the mentioned functions. (ex. once the mode button is touched the display screen 1003 will show "watch functions" and "security functions"; the user will then utilize the up or down scroll buttons 1022 and 1026 to highlight the function and then will utilize the select button 1010 or 1018 to select the function to be entered.)~~

Conclusion, Ramifications, and Scope of Invention

The remote watch security system provides a very reliable, economical device that can be used by persons of almost any age, linking the individual to his/her vehicle at all times, giving feedback on the condition of the vehicle and vibrating or beeping to alarm the individual that their vehicle is being tampered with. While the above description contains many specificities, these should not be construed as limitations on the scope of the invention, but rather as an exemplification of one preferred embodiment thereof. Many other variations are possible that we did not consider important enough to show in drawing and describe in detail in our description. For example, this device can have minor variations in color, size, and materials. Furthermore, the digital watch can have variations in these areas:

- the wrist bands can be synthetic in different colors, or metallic (ex. Titanium)
- the entire watch transmitter can be metallic
- the display screen can light in various colors (ex. Red, green, yellow etc.)
- entire watch remote can be hard plastic with a synthetic band
- the watch transmitter can be made in various shapes and sizes (ex. Round, rectangular, square etc.)

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- the ~~flip-up component~~ hinged body can have an outer digital display clock or not
- the watch transmitter can have a flip up component or not
- the ~~flip-up component~~ hinged body can have an analog watch face with short hand and long hand on the outer part of the ~~flip-up component~~ hinged body and a display screen on the interior part of the ~~flip-up component~~ hinged body
- the keypad can be arranged in many ways and the buttons can be in various shapes, sizes, and made from different materials (rubber, plastic, metal alloy, etc.)
- the keypad can be used for various functions related to the watch and the security system
- the outer buttons on the sides of the watch transmitter can be in different shapes, sizes and colors and can be used for various functions
- the range in which the watch remote can control the security system can be changed (ex. extended for longer range)
- the watch transmitter can incorporate different trademarks and logos of designer watch, clothing, and automotive manufacturers
- the watch transmitter can have automatic sliding components
- the watch transmitter can have voice commands (ex. through the use of voice command the security system can be armed/locked, disarmed/unlocked, remotely started etc.)
- the display screen can be in various sizes
- the program of the watch can have a menu selection screen with various options to cycle through
- the digital watch remote will be able to operate other power functions for different vehicles (ex. Power rear gate and power side sliding doors for mini-vans).
- The battery can be a rechargeable Ni-Cd battery that allow for extended battery life and lower maintenance cost for the user.
- Watch transmitter can be solar powered

Substitute Specification**- 18 -****Abstract**

A remote watch (Figures 7) design for a car security system, comprising of a display screen and base **706** with keypad **704**. A user of the remote watch will not only be able to keep track of the time but also will be able to arm/lock, disarm/unlock and remotely start their vehicle by pushing specific buttons on the watch. It is common for people to lose or misplace their keys along with the keyless remote that is attached to the keys. Since the watch is placed on the users wrist, the user never has to worry about damage due to dropping it on a hard surface, in liquids (ex. water), or even losing their keyless remote as you would by having a keyless remote attached to keys or a key chain. If the user ever loses their keys, the remote watch will now allow the user to still have access to their vehicle without their keys, thus giving the user the freedom to store an extra set of keys in their vehicle in case they lose the original ones.

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Background – Prior art (Discussion and Criticism of the relevant prior art)

Some of the latest inventions in the field of car security have been the 2-way transceivers.

They comprise of:

- i. A display screen
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The 2-way transceiver remote confirms that your vehicle has received signals and alerts the user to system triggers and theft attempts. This remote can display 20 different icons including transmit, receive, remote start, arm/disarm, hood, trunk, door ajar, and extra sensors. The Auto Security Compustar is a semi-small remote start keyless entry that displays a car on the screen and shows the part of the car that is being tampered with.

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These particular devices look like toys. They both still hold true to the traditional keyless entry remotes that can be attached to a key chain and possibly damaged by those people who toss their keys around and lost by those who are careless. It is also not waterproof as our invention can be and will not have the style along with convenience, as our invention will.

Objectives and Advantages (positive aspects of invention)

- The advantages of this invention are:
 - i. Digital or analog or a combination of digital/analog
 - ii. Linking the individual to his/her vehicle at all times
 - iii. Vibrates/beeping sound to alarm an individual whenever the vehicle is being tampered with and when the alarm is triggered.
 - iv. The watch gives you feedback by transmitting the condition of the vehicle.
 - v. This invention is located in the most convenient and easy to access area, the user's wrist. Having the device on the wrist will allow hassle-free convenient usage. Other car security devices have to be pulled out of a pocket, bag, or another area.
 - vi. The watch displays the time.
 - vii. Keeps track of time and a vehicle at all times.
 - viii. If you loose your keys you will also loose your keyless entry alarm remote. Since the security system is located on the watch, a person does not have to worry about losing the keyless remote.

- ix. If you loose your keys then a person can feel safe about leaving a spare key in the car because they will still be able to unlock and disarm the security system from the remote watch which is worn on your wrist and not attached to the keys which can be lost.

Drawings & Figures

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100-Controller Processing Unit	115-Valet Switch
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106-Trigger and Sensor Circuitry	120-Armed Output
107-Proximity Detector	121-Automatic Starter
108-Transceiver	122-Character Display
109-Input Interface	123-Dome Light
110-Output Interface	124-Valet/Dashboard LED
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113-Hood Switch	103-Operational Signal
114-Door Switch	

Reference Numerals**Figure 2: Block Diagram of the Digital Watch Remote**

200-Watch Remote Console	207-Control Section
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204-Date(Month/Day)	211-Transmission Section
205-Time(Hour/Minute)	212-Code Data
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Clean Amended Specification**- 24 -****Reference Numerals****Figure 3: Basic Outline of Switching Device**

300- Watch & Remote Control Transmitter	302- Switch select lines
301- Switching Circuitry	304- Select Switching Lines

Reference Numerals**Figure 4: EnMOSFET Switch**

400-Switched Circuit	403b-Gate of enhancement MOSFET switch
401-Low voltage terminal of the switch	403c-Drain of enhancement MOSFET switch
402-High voltage terminal of the switch	404-2k Ω Resister
403-n-channel enhancement MOSFET	405-Power Source
403a-Source of enhancement MOSFET switch	

Reference Numerals**Figure 5: Small AC Equivalent Output Circuit**

500a-What the AC output circuit is connected to	504a-2k Ω Resister
500b- What the AC output circuit is connected to	504b-2k Ω Resister
501a-High voltage terminal of switch (on)	505a- Drain of enhancement MOSFET switch (on)
501b- High voltage terminal of switch (off)	505b- Drain of enhancement MOSFET switch (off)
502a-Low voltage terminal of switch (on)	506a-Source of enhancement MOSFET switch (on)
502b- Low voltage terminal of switch (off)	506b- Source of enhancement MOSFET switch (off)
503a-RDS on – On position resister	503b-RDS off – Off position resister

Reference Numerals**Figure 6: EACS Controlled Switch System**

600-3V Battery voltage	605a-Voltage for Low Line 8 to 1 Multiplexer
601-Remote transmitter circuit	606- Low voltage terminal of the switch
602-Watch Circuit	607- High voltage terminal of the switch
603a-High voltage lines for the watch circuit	608-Voltage for EACS Switch
603b-Low voltage lines for the watch circuit	609-EACS Switch
604a-High voltage lines for the Remoter Transmitter circuit	610- Gate of EACS switch
604b-Low voltage line for the Remote Transmitter circuit	611- High Line 8 to 1 Multiplexer
605-Voltage for High Line 8 to 1 Multiplexer	612- Low Line 8 to 1 Multiplexer

Reference Numerals**Figure 7: Flip-up Watch Remote Drawing**

701- Exterior Digital Clock	705-Hinged Body
702- Interior Display Screen	706-Base
703- Interior Display Screen	707-Mode Button
704- Keypad	708-Select Button
727 – Hinge	

Reference Numerals**Figure 8: Flip-up Watch Remote Drawing**

801- Exterior Digital Clock	806-Base
802- Interior Display Screen	807-Mode Button
803- Interior Display Screen	808-Select Button
804- Keypad	809- Light
805-Hinged Body	810- Hinged Body Open Button

Reference Numerals**Figure 9: Basic Watch Remote Drawing**

900-display screen	904- remote start
901-light	905- arm/lock
902- disarm/unlock	906-base
903- panic	907- mode

Reference Numerals**Figure 10: Keypad Description of Watch Remote**

1011-remote start	1019- numeric 4/letters I,J
1012-arm/lock doors	1020- numeric 5/letters K,L
1013-disarm/unlock doors	1021- numeric 6/letters M,N
1014-panic	1022- up scroll/letters O,P
1015-numeric 7/letters Q,R	1023- numeric 1/letters A,B
1016-numeric 8/letters S,T	1024- numeric 2/letters C,D
1017- numeric 9/letters U,V,W	1025- numeric 3/letters E,F
1018- numeric 0/letters X,Y,Z	1026- down scroll/letters G,H

Description –Main Embodiment (narrative of the structure)

Figure 7 shows the side view of the remote watch. The digital clock **701** located on the outside surface of the hinged body **705** will display watch information such as the time and date. The interior display screen **702** located on the base **706** of the watch remote will display the time and alternative watch functions (calendar, schedule, etc.). The interior display screen **702** is displayed when the hinged body **705** is opened. The display screen **703** located on the inside of the hinged body **705** will display

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feedback of various car functions. For example, if the armed button is pressed, the display screen 703 will display feedback information for the car alarm functions related to arming the vehicle.

Figure 8 shows the same version of the watch from a frontal/top view displaying the entire hinged body 805, the hinge 827 whereby the said hinged body 805 will be able to be attached to the base 806 and flip upward showing the interior components. The entire hinged body 805 that contains an outside digital clock display 801, an interior display screen 803, and base 806. The said hinged body 805 is preferably made of stainless steel and has a thickness less than that of the base 806. The outside display clock 801 will preferably be a liquid crystal display screen, where the width of the screen will be the same as the interior display screen 802. The length of the said outside display clock will be less than half of the interior display screen or at least 1.0 cm long. The interior display screen 802, a display screen 803, and a keypad 804 are visible when the said hinged body 805 is opened by pressing the hinged body open button 810. Both the interior display screen 802 and the other display screen 803 will also be liquid crystal display screens. Display screen 802 will show the functions of the car alarm (ex. If the alarm is armed or disarmed, remote started, sunroof open/closed, etc.). Said display screen 803 is shown directly below the said display screen 802 as seen in figures 7 and 8. Display screen 803 will display the time, date, and calendar that are accessed through the use of the mode button 807. The light button 809 will be used to activate the background light for all display screens. With the select button 808, the user will have the ability to activate the menu options.

Operation –Main Embodiment (How it works)**Explanation of Circuits**

Figures 3, 4, 5, & 6

This design assumes the main source of power is a 3 V DC supply for a watch circuit and for a remote control transmitter circuit. It is assumed that eight single-post-single-throw switches are available, each connected to some switched circuit and each with a low voltage terminal and a high

voltage terminal. The circuit works for a low voltage terminal post that is approximately at ground potential and for small AC signals at open-circuited switch terminals. The L^{th} pair of switch lines are connected to an impedance (Z_{SDL}) that models the L^{th} switched circuit, $L \in \{1, 2, \dots, 8\}$.

Figure 3

By assumption, eight switches are available from two systems: the watch and the remote control transmitter **300**. The switching circuitry **301** enables the controlling and operating means of the watch and security system functions by the selection of any one of the eight pairs of lines **304** across which a switch can be placed. This selection occurs by placing a three-bit binary address on the switch select lines **304**. In addition, the switching circuitry **301** develops an electronic switch that opens and closes, placing it across the selected pair of lines (the L^{th} lines).

Figure 4

Normally a mechanical SPST switch with two terminals is connected to a “switched circuit **400**.” This switch is removed, replaced by an electronic switch **403**. The electronic switch **403** consists primarily of an enhanced metal oxide semiconductor field effect transistor (EnMOSFET). The EnMOSFET switch consists of a source **403a**, gate **403b**, and drain **403c**. The EnMOSFET AC Switch (EACS) circuit indirectly connects the high **402** and low **401** terminals of the switch for small AC signals. The $2k\Omega$ resistor **404** on the drain provides on-state protection, and determines a DC quiescent point.

Figure 5

A & B

Figure 5a shows the EnMOSFET switch connected to the AC output **500a**. When the gate voltage of the EnMOSFET switch is high **501a** (~ 3 V), turning the transistor on, an AC ground exists on the drain **505a** terminal of the FET placing the drain **505a** and source **506a** at approximately the same potential. Figure 5b is the closed circuit condition of the electron switch. When the gate voltage is low **502b**, AC current flow discontinues resulting in an open circuit or the open electron switch **503b** condition. The $2k\Omega$ resistor **504b** on the drain provides on-state protection, and determines a DC quiescent point.

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Figure 6

This design assumes the main source of power is a 3 V DC **600** supply for a watch circuit **602** and for a remote control transmitter **601** circuit. It is assumed that eight single-post-single-single-throw switches are available, each connected to some switched circuit and each with a low voltage terminal (**603b** & **604b**) and a high voltage terminal (**603a** & **604a**). The switching circuitry primarily consists of the EACS **609** and two multiplexers. Two 8-to-1 multiplexers operate in parallel sharing the same address lines (switch select lines). One multiplexer **611** selects the high potential terminal of the Lth switch and the other **612** selects the low potential terminal. The EACS **609** produces the opening and closing actions of the switch.

Operation**Figure 2****Watch Transmitter**

The remote watch car alarm system includes the watch (see Fig.2) and an onboard control module (see Fig 1). The watch that is worn by the vehicle owner/operator consists of an LCD screen **202**, operational keypad **201**, code generator **210**, mode controller **209**, memory **203**, timer **208**, transceiver **211**, and buzzer **206**. The onboard module (see fig 1) will consist of a controller processing unit **100** or a microprocessor program controller, timer **105**, memory unit **104**, transceiver **108**, proximity detector **107**, sensor zone circuitry **106**, input interface **109**, and an output interface **110**.

Referring to the schematic block diagram of FIG. 2, the remote watch includes a liquid crystal display **202** for displaying such information as the time, date, Mode State of the watch, and preset alarm times. The said watch will also include an operational keypad **201** for entering a variety of functions including, information for the date and time or car security functions such as arm/disarm, remote start and etc.

The control section **207** of the watch has a mode controller **209**, code generator **210**, and an alarm timer **208**. The mode controller **209** sets the mode in which the watch will operate. The code generator **210** inputs code data **212** to the circuitry of the transceiver **211**. The timer **208** will cause the

mode controller **209** to switch back to the watch setting (mode) after a car security button is pressed on the keypad **201**. The timer **208** will then alert the user when an alarm time is activated via the buzzer **206**. As would be readily understood by those skilled in the art.

The digital remote watch further includes memory (**203**) and a buzzer (**206**). The memory **203** will be used for storage of data such as the set alarm generating time (wake-up alarm), the mode being currently affected, the month, day, year data, and the time (hour/minute). The buzzer **206** will chirp with the corresponding car security functions (ex. arm/disarm) as well as with (wake-up) alarm settings.

Operation

Figure 1

Onboard Control Module

Referring to Fig. 1, the operational signal **103** from the digital watch remote **102** is received by the external antenna **101** then the transceiver **108** receives the amplified signal from the transmitting/receiving antenna **101** and feeds the received operational signal to the proximity detector **107**. The proximity detector **107** verifies the interrogating signal, detects the level of received operation signal, generates a proximity signal when the signal is above a predetermined level, the detector then feeds the proximity signal to the controller processing unit **100**.

The controller-processing unit **100** generates a series of control signals or pulses as its outputs. These include activities such as locking the doors and arming the system. For example, arming the system causes a flash of the automobile parking lights **125**, a single chirp from the siren **126**, and causing the flashing the interior LED **124** status indicator to activate. Additionally, arming the system causes the starter **118** to be cut and if the interior dome light **123** is on, to turn it off, as would be readily understood by those skilled in the art.

The timer component **105** measures a preset time and is set and/or reset under the control of the controller-processing unit **100**. The memory **104** functions as an internal memory for the controller-processing unit **100** or as an auxiliary memory for other components or devices incorporated in the system. Data writing to or reading from the memory is performed under the control of the controller-processing unit **100**. This is readily understood by those skilled in the art.

As illustrated, the input interface **109** is connected to various vehicle inputs including an ignition switch **111**, trunk switch **112**, hood switch **113**, door switches **114**, key in ignition switch, pre-warn sensor, valet switch **115** and zone sensors **106**. The sensor zone circuitry **106** performs the security function of the automobile. When the sensor zone circuitry **106** detects tampering, it generates a signal and feeds it directly to the controller-processing unit **100**. As would be readily understood by those skilled in the art, other inputs are also contemplated by the present invention and are described by the term sensor.

The output interface **110** of the controller-processing unit **100** can be connected to a variety of output devices. The outputs may include and not limited to auxiliary relays such as window control **116** or remote start **121**, as would be readily understood by those skilled in the art. Other outputs include a panic output **117**, starter kill **118**, disarm/arm outputs **119/120**, dome light **123**, parking lamps **125**, siren **126**, alphanumeric character display **122**, and valet/dashboard red or green emitting LED's **124**.

Operation

Figure 9

Basic Design

Figure 9 shows a prototype of the watch from a top view and a side view showcasing buttons for the security system and display screen. The manner of using the watch remote security system is

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simple, the security system can be armed by pushing the arm button **905** and disarmed by pushing the disarm button **902**. The panic button **903** will cause the alarm to sound when pushed. The mode button **907** will enable a person to change the time/date. The light button **901** will illuminate the display screen(s).

Operation**Figure 10**

The user can switch the function of the watch using the directional buttons **1022 & 1026** to navigate through the menu options, and the select button **1010** or the tri-functional button **1018** will be used to select a particular menu option. -The remote start button **1011** will start the user's vehicle; arm/lock button **1012** will arm the security system and lock the user's vehicle. The disarm/unlock button **1013** will disarm the car security system and unlock the vehicle; the panic button **1014** will cause the car security alarm to activate when depressed.-Reference numerals **1015-1021** are alpha/numeric buttons which are used for inputting numbers/letters for the setting of time, date, names, changing the date, telephone numbers, etc. Reference numerals **1022 & 1026** are the alpha/directional buttons, which navigate the user through the digital security watch's menu functions. Button **1018** is a tri-functional button that allows the user to select a menu option, input the number 0, or the letters XYZ.

Conclusion, Ramifications, and Scope of Invention

The remote watch security system provides a very reliable, economical device that can be used by persons of almost any age, linking the individual to his/her vehicle at all times, giving feedback on the condition of the vehicle and vibrating or beeping to alarm the individual that their vehicle is being tampered with. While the above description contains many specificities, these should not be construed

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as limitations on the scope of the invention, but rather as an exemplification of one preferred embodiment thereof. Many other variations are possible that we did not consider important enough to show in drawing and describe in detail in our description. For example, this device can have minor variations in color, size, and materials. Furthermore, the digital watch can have variations in these areas:

- the wrist bands can be synthetic in different colors, or metallic (ex. Titanium)
- the entire watch transmitter can be metallic
- the display screen can light in various colors (ex. Red, green, yellow etc.)
- entire watch remote can be hard plastic with a synthetic band
- the watch transmitter can be made in various shapes and sizes (ex. Round, rectangular, square etc.)
- the hinged body can have an outer digital display clock or not
- the watch transmitter can have a flip up component or not
- the hinged body can have an analog watch face with short hand and long hand on the outer part of the hinged body and a display screen on the interior part of the hinged body
- the keypad can be arranged in many ways and the buttons can be in various shapes, sizes, and made from different materials (rubber, plastic, metal alloy, etc.)
- the keypad can be used for various functions related to the watch and the security system
- the outer buttons on the sides of the watch transmitter can be in different shapes, sizes and colors and can be used for various functions
- the range in which the watch remote can control the security system can be changed (ex. extended for longer range)
- the watch transmitter can incorporate different trademarks and logos of designer watch, clothing, and automotive manufacturers
- the watch transmitter can have automatic sliding components

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- the watch transmitter can have voice commands (ex. through the use of voice command the security system can be armed/locked, disarmed/unlocked, remotely started etc.)
- the display screen can be in various sizes
- the program of the watch can have a menu selection screen with various options to cycle through
- the digital watch remote will be able to operate other power functions for different vehicles (ex. Power rear gate and power side sliding doors for mini-vans).
- The battery can be a rechargeable Ni-Cd battery that allow for extended battery life and lower maintenance cost for the user.
- Watch transmitter can be solar powered

Clean Amended Specification**- 35 -****Abstract**

A remote watch (Figures 7) design for a car security system, comprising of a display screen and base 706 with keypad 704. A user of the remote watch will not only be able to keep track of the time but also will be able to arm/lock, disarm/unlock and remotely start their vehicle by pushing specific buttons on the watch. It is common for people to lose or misplace their keys along with the keyless remote that is attached to the keys. Since the watch is placed on the users wrist, the user never has to worry about damage due to dropping it on a hard surface, in liquids (ex. water), or even losing their keyless remote as you would by having a keyless remote attached to keys or a key chain. If the user ever loses their keys, the remote watch will now allow the user to still have access to their vehicle without their keys, thus giving the user the freedom to store an extra set of keys in their vehicle in case they lose the original ones.